AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Previously Presented) An optical wavelength converter for converting input phase-modulated light at a first wavelength to output phase-modulated light at a second wavelength, the wavelength converter comprising:

an input-light splitter splitting the input phase-modulated light at the first wavelength into first split light at the first wavelength and second split light at the first wavelength;

a multiplex-interference portion multiplex-interfering the first split light and the second split light to generate intensity-modulated light having the first wavelength, the multiplex-interference portion including

an injection synchronization laser diode generating continuous wave light at the first wavelength, and

a multiplex optical coupler multiplexing the continuous wave light at the first wavelength and generated by the injection synchronization laser diode and the second split light at the first wavelength to produce the intensity-modulated light;

a laser diode generating continuous wave light at the second wavelength; and

a phase modulation portion receiving the intensity-modulated light and the continuous wave light at the second wavelength from the laser diode, cross-phase modulating the continuous wave light at the second wavelength in response to phase modulation of the input phase-modulated light.

Claim 2 (Cancelled).

3. (Previously Presented) The optical wavelength converter according to claim 8, wherein the multiplex-interference portion includes a delay portion for delaying one of the first split light and the second split light by one-bit delay time relative to the other of the first split light and the second split light in the multiplex interfering.

4. (Previously Presented) The optical wavelength converter according to claim 1, wherein the phase modulation portion comprises a semiconductor optical amplifier cross-phase modulating the continuous wave light at the second wavelength.

5. (Previously Presented) The optical wavelength converter according to claim 8, wherein the first phase modulator comprises a semiconductor optical amplifier cross-phase modulating the continuous wave light at the second wavelength.

6. (Previously Presented) The optical wavelength converter according to claim 1, wherein the phase modulation portion comprises an electro-absorption optical modulator cross-phase modulating the continuous wave light at the second wavelength.

7. (Previously Presented) The optical wavelength converter according to claim 8, wherein the first phase modulator comprises an electro-absorption optical modulator cross-phase modulating the continuous wave light at the second wavelength.

8. (Previously Presented) An optical wavelength converter converting input phase-modulated light at a first wavelength to output phase-modulated light at a second wavelength, the wavelength converter comprising:

an input-light splitter splitting the input phase-modulated light at the first wavelength into first split light at the first wavelength and second split light at the first wavelength;

a multiplex-interference portion multiplex-interfering the first split light and the second split light to generate intensity-modulated light at the first wavelength;

a laser diode generating continuous wave light at the second wavelength; and

a phase modulation portion receiving the intensity-modulated light and the continuous wave light at the second wavelength, cross-phase modulating the continuous

wave light at the second wavelength in response to phase modulation of the input phase-modulated light, the phase modulation portion comprising a plurality of phase modulators connected in series, the plurality of phase modulators including

a first phase modulator that cross-phase modulates the intensity-modulated light at the first wavelength generated by the multiplex-interference portion and the continuous wave light at the second wavelength, and

a second phase modulator that cross-phase modulates subsequent-stage intensity-modulated light and subsequent-stage phase-modulated light at the second wavelength and generated by the first phase modulator.

Claims 9 and 10 (Cancelled).

11. (Currently Amended) ~~The~~ An optical wavelength converter ~~according to claim 15, further~~ for converting input phase-modulated light at a first wavelength to output phase-modulated light at a second wavelength, the wavelength converter comprising:

an input-light splitter splitting the input phase-modulated light at the first wavelength into first split light at the first wavelength and second split light at the first wavelength;

a multiplex-interference portion multiplex-interfering the first split light and the second split light to generate intensity-modulated light at the first wavelength, the multiplex-interference portion including a delay portion for delaying one of the first split light and the second split light by a one-bit delay time relative to the other of the first split light and the second split light in the multiplex interfering portion;

a laser diode generating continuous wave light at the second wavelength;

a phase-modulation portion including a semiconductor optical amplifier receiving the intensity-modulated light and the continuous wave light at the second wavelength and cross-phase modulating the continuous wave light at the second wavelength in response to phase-modulation of the input phase-modulated light; and

an optical bistable device for generating the intensity-modulated light at the first wavelength with an optical-power intensity varied in response to an optical pulse generated by the multiplex-interference portion.

12. (Previously Presented) The optical wavelength converter according to claim 1, wherein the multiplex-interference interference portion includes an optical circulator receiving the first split light and the continuous wave light at the first wavelength from the injection synchronization laser diode, supplying a portion of the first split light to the injection synchronization laser diode, and supplying output light to the multiplex optical coupler.

13. (Previously Presented) The optical wavelength converter according to claim 1, wherein the phase modulation portion includes an optical circulator receiving the intensity-modulated light from the multiplex optical coupler, receiving light at the second wavelength from the laser diode, and outputting the phase-modulated light at the second wavelength.

14. (Currently Amended) ~~the~~ The optical wavelength converter according to claim 8 wherein each of the first and second phase modulators includes a three-port optical coupler.

15. (Currently Amended) An optical wavelength converter for converting input phase-modulated light at a first wavelength to output phase-modulated light at a second wavelength, the wavelength converter comprising:

an input-light splitter splitting the input phase-modulated light at the first wavelength into first split light at the first wavelength and second split light at the first wavelength;

a multiplex-interference portion multiplex-interfering the first split light and the second split light to generate intensity-modulated light at the first wavelength, the multiplex-interference portion including a delay portion for delaying one of the first

split light and the second split light by a one-bit delay time relative to the other of the first split light and the second split light in the multiplex interfering portion;

a laser diode generating continuous wave light at the second wavelength; and

a phase-modulation portion including

a semiconductor optical amplifier receiving the intensity-modulated light and the continuous wave light at the second wavelength and cross-phase modulating the continuous wave light at the second wavelength in response to phase-modulation of the input phase-modulated light; and

an optical circulator receiving the intensity-modulated light, receiving light at the second wavelength from the semiconductor laser, supplying the intensity-modulated light to the semiconductor optical amplifier, and outputting the phase-modulated light at the second wavelength.

Claim 16 (Cancelled).